

## REMARKS

The Applicants appreciate the thoroughness with which the subject application has been examined and the indication of allowable subject matter in claims 16 and 22. By this amendment, certain claims, as indicated above, have been amended to overcome the Examiner's rejections and more concisely claim and describe the present invention. Claims 1-29 remain in the application for reconsideration by the Examiner. The Examiner's allowance of all pending claims is earnestly solicited.

### MATTERS RELATED TO THE DRAWINGS

In response to the Examiner's comments regarding Figure 1, a replacement sheet for Figure 1 is attached as Attachment 1. The replacement sheet indicates that Figure 1 is prior art.

The Examiner has objected to the drawings under 37 C.F.R. 1.83(a) as failing to show certain features set forth in the claims. In response to this objection, the Applicants submit new Figures 12 and 13 (included as Attachment 1) on a single sheet of paper labeled "Replacement Sheet." As set forth above, references to the new Figures have been added to the application in the BRIEF DESCRIPTION OF THE DRAWINGS and in the DETAILED DESCRIPTION OF THE INVENTION. Since the embodiments illustrated in new Figures 12 and 13 were described in the application as originally filed, these Figures do not represent new matter. Instead, they merely illustrate that which was previously claimed.

### MATTERS RELATED TO THE SPECIFICATION

The Applicants have identified several typographical informalities in the specification and propose to correct those informalities as indicated above in the marked-up specification paragraphs.

The Examiner has objected to the specification for failing to provide proper antecedent basis for certain claimed subject matter.

In response, the Applicants have added material describing Figures 12 and 13 to the specification. It is respectfully submitted that this textual material does not represent new matter as it merely describes what was previously set forth in claims 8 and 14 as originally submitted.

## MATTERS RELATED TO THE CLAIMS

Within the first claim set comprising claims 1-16, the Examiner has rejected claim 1 and claims 9-14 under Section 102(b) as anticipated by Rawnick (6,300,906). Claims 2-5 stand rejected under Section 103(a) over Rawnick in view of Nealy. Claims 6-8 have been rejected under Section 103(a) over Rawnick in view of Goubau. Claim 15 stands rejected under Section 103(a) as unpatentable over Rawnick in view of Moustakas (6,556,173). Claim 16 has been objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all limitations of the base claim and any intervening claims.

To further define the invention over the cited art, the Applicants have amended claim 1 as set forth above in the marked-up version of the claim. In particular, the Applicants have amended the third and fourth paragraphs of claim 1 to read, “first ones of the plurality of conductive regions each having a conductive via connected to the ground plane; and second ones of the plurality of conductive regions each having a conductive via connected to the signal feed.”

Rawnick discloses a phased array antenna comprising a plurality of four-square antenna elements. Further, Rawnick's printed circuit network 70 (see Figure 10) is a signal distribution layer comprising baluns and branch lines for distributing an input signal supplied via the input cable 26 to the four-square elements of the antenna array. Specifically, Rawnick discloses, “the support structure for the associated feed, balun and power divider circuitry is configured of a laminate design. This laminate design contains a plurality of power divider-feed networks that incorporate printed circuit baluns for alternate sets of antenna elements linearly distributed on a stripe-shaped dielectric feed network support member.” See column 1 beginning at line 56. Rawnick does not disclose ground vias connected to the ground plane nor does he disclose, “ground and signal vias [are] electrically connected to the conductor segment” as set forth in the final paragraph of the Applicants' amended claim 1.

Further, it is respectfully submitted that there is no disclosure in Rawnick that would render the Applicants' invention as set forth in amended claim 1 obvious under Section 103(a), since Rawnick's power distribution network 70 provides signal feeds to antenna elements of an antenna array, whereas the Applicants claim, “ground and . . . signal vias . . . electrically connected to the conductor segment.”

As to rejected claims 2-15, the Applicants contend that each of these claims, depending directly or indirectly from amended claim 1, includes one or more elements that further

distinguish the invention over the art of record. These claims should therefore be in condition for allowance. It is further noted that Nealy and Goubau do not describe or even suggest the existence of an intermediate layer comprising a conductor segment. It is thus not seen how any combination of these references with Rawnick discloses, suggests or motivates combining their respective disclosures to disclose or suggest the Applicants' invention as set forth in those claims 2-5 and 6-8 rejected under Section 103 over the reference combinations.

As to the objection of claim 16, the Applicants appreciate the Examiner's indication of allowable subject matter in the claim. However, at this point in the prosecution process, the Applicants elect to hold in abeyance the re-writing of claim 16 pending the Examiner review of the presented claim amendments and remarks, as it is suggested that claim 16 is currently allowable based on the amendments to claim 1 from which it depends. Reconsideration of this request to re-write claim 16 in independent form is respectfully requested.

Independent claim 17 stands rejected under Section 102(b) as anticipated by Rawnick.

Rawnick was discussed at length above. At this point, it is simply noted that Rawnick does not disclose, "a conductive ground via connected between at least one of the plurality of conductive regions and extending downwardly to a bottom surface of the first dielectric layer for connection to the ground plane." Nor does Rawnick disclose the Applicants' element, "the ground and the signal vias . . . electrically connected to the conductor segment."

It is therefore respectfully submitted that claim 17 as amended is allowable over Rawnick. Further, no rejection of claim 17 under Section 103(a) is appropriate in view of the lack of a suggestion or motivation in the prior art that discloses the Applicant's invention as set forth in claim 17.

Within the claim set comprising independent claim 18 and dependent claims 19-22, claims 18, 19 and 20 stand rejected under Section 102(b) in view of Rawnick. Claim 21 stands rejected under Section 103(a) over Rawnick in view of Nealy. Claim 22 has been objected to but would be allowable if re-written to include all the limitations of the base claim and any intervening claims.

Having discussed Rawnick at length above, it is noted that Rawnick does not disclose, suggest or motivate at least two elements of the Applicants' claim 18, including, "a conductive ground via connected between at least one of the plurality of conductive regions and the ground plane," and "wherein the ground and the signal vias are electrically connected to the conductor

segment.” Rawnick does not mention conductive ground vias and thus cannot disclose, suggest or motivate the Applicants’ invention as set forth in claim 18.

As to rejected claims 19-21, the Applicants contend that each of these claims includes one or more elements that further distinguish the invention over the art of record. These claims should therefore be in condition for allowance.

The Applicants also request the Examiner’s reconsideration of the allowance of claim 22 as dependent from independent claim 18 and therefore allowable for the same reasons that claim 18 is allowable. Following the Examiner’s reconsideration of this issue, the Applicants will reconsider rewriting the claim in independent form.

Independent claim 23 (and claims 24-26 dependent therefrom) have been rejected under Section 103(a) over Rawnick in view of Goubau.

As discussed above, Rawnick discloses a printed circuit network 70 that provides signal distribution functionality from the single coaxial cable 26 that supplies an input signal to Rawnick’s antenna array. Goubau discloses, in Figure 5, “one pair [of identical segments] comprising the conductors 20 and the capacitor plates 22 is electrically interconnected at the lower ends of the conductors, and connected to the input terminal. The other pair of identical segments comprising conductors 21 and capacitor plates 23 has the lower ends connected to the ground plane.”

Examiner Chen suggests that, “it would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute the ground via and signal via as shown in Rawnick, et. al., by using the ground via and the signal via as taught by Goubau in order to obtain large bandwidth to permit the antenna to be used effectively for a number of operating wavelengths.” The conjecture offered by the Examiner as to the combinability of Rawnick and Goubau does not satisfy the principles governing reference combinations. Instead, the Examiner has merely excerpted one phrase from Rawnick and juxtaposed it with the Examiner’s rationale to justify the combination with Goubau. Goubau is not concerned with, and does not even mention, the use of an intermediate conductive layer such as Rawnick’s printed circuit network 70. Rawnick does not mention ground vias. Thus, the proposed combination is a mere aggregation of the references without any disclosure or suggestion in either reference that permits the combination. Given the structural and functional disparities between Rawnick and Goubau, the only suggestion for combining the references stems from hindsight knowledge derived from

the Applicants' invention. Without a disclosure in at least one of the references, the proposed combination cannot stand.

Additionally, neither Rawnick nor Goubau individually disclose the various elements of the Applicants' invention as set forth in claim 23, including at least the element, "wherein the ground and the signal vias are electrically connected to the conductor segment." If neither reference discloses certain elements of the Applicant's invention, how can the combination disclose those elements.

As to rejected dependent claims 24-26, the Applicants contend that each of these claims includes one or more elements that further distinguish the invention over the art of record. These claims should therefore be in condition for allowance.

Independent claim 27 stands rejected under Section 102(b) over Rawnick. Since Rawnick has been discussed at length above, it is noted at this point that the Applicants' claim 27 includes, "at least one conductive ground via connected to the conductive plate and extending to the second surface," and, "at least one conductive signal via connected to the conductive plate and extending to the second surface." A careful review of Rawnick reveals that there is no mention of ground vias within the Rawnick patent. Although Rawnick does mention a ground plane, the lack of a ground via disclosure renders the Applicant's invention as set forth in claim 27 patentably distinct from Rawnick.

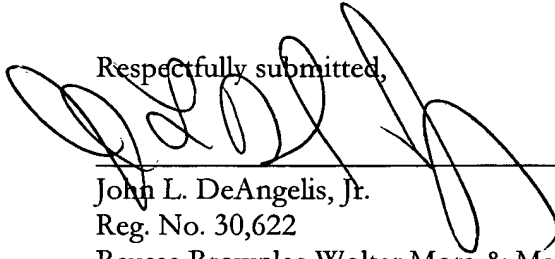
Independent claims 28 and dependent claim 29 also stand rejected under Section 102(b) over Rawnick. Rawnick fails to disclose at least the following steps set forth in independent claim 28, "forming at least one conductive ground via connected to a first one of the plurality of conductive regions and extending to the second surface; forming at least one conductive signal via connected to a second one of the plurality of conductive regions and extending to the second surface; and wherein the at least one ground via and the at least one signal via are further connected to the conductive segment." Rawnick's printed circuit board power distribution network 70 does not provide the same functionality or the same structural features as set forth in the Applicants' claim 28.

The Applicants contend that claim 29, depending from independent claim 28 includes one or more elements that further distinguish the invention over the art of record, including the third conductive layer, "and wherein the step of forming at least one ground via further comprises connecting the ground via to the third conductive layer."

The Applicants have attempted to comply with all of the points raised in the Office Action and it is believed that the remaining claims in the application, i.e., claims 1-29, are now in condition for allowance. In view of the foregoing amendments and remarks, it is requested that the Examiner's specification objections and claim rejections have been overcome. It is respectfully requested that the Examiner reconsider these rejections and objections and issue a Notice of Allowance for all claims pending in the application.

If a telephone conference will assist in clarifying or expediting this Amendment or the claim amendments made herein, the Examiner is invited to contact the undersigned at the telephone number below.

Respectfully submitted,



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John L. DeAngelis, Jr.  
Reg. No. 30,622  
Beusse Brownlee Wolter Mora & Maire, P.A.  
390 North Orange Avenue, Suite 2500  
Orlando, FL 32801  
(407) 926-7710

CERTIFICATE OF MAILING

I HEREBY CERTIFY that the foregoing Amendment is being deposited with the U.S. Postal Service as first class mail in an envelope addressed to: Mail Stop Non-Fee Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 28th day of March, 2005.



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Pamela A. Pagel

ATTACHMENT 1

FIGURES 1, 12 and 13